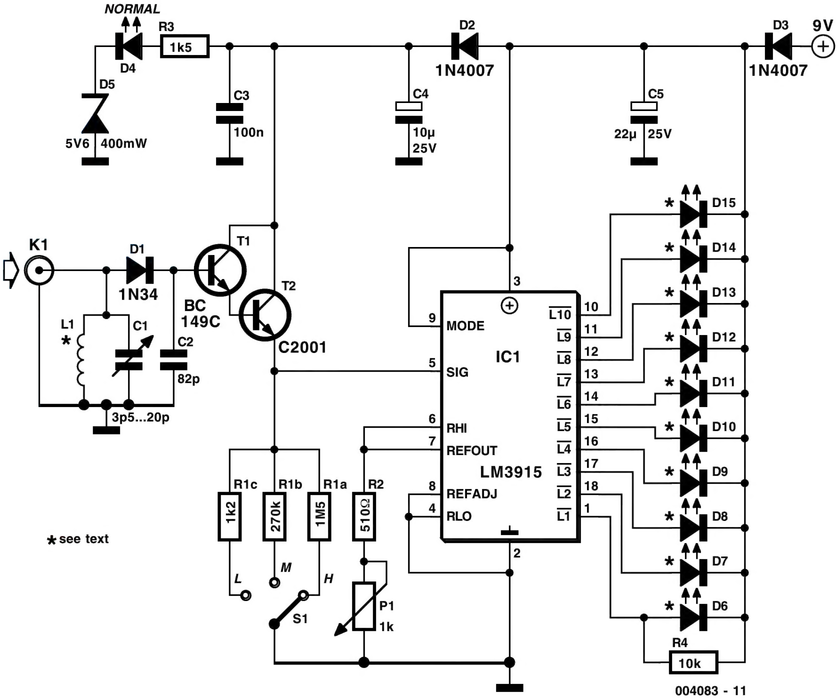
010 Relative Fieldstrength Meter for 2-m Band



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A fieldstrength meter (FSM) is extremely useful for radiation gain/loss and radiation pattern measurements, and, in general, to discover why some antennas perform better than others.

This FSM is designed for work on 2-metre band (144-146 MHz) antennas, in particular, Yagi types which require quite a bit of tweaking for optimum performance. A tuned RF filter, L1-C1, is used at the input to make the FSM selective for the desired band. The heart of the circuit is the popular LM3915 3 dB/step analogue display driver from National Semiconductor. A continuous-scale readout is available in the form of a LED bar. Dot mode may also be selected by disconnecting IC1 pin 9 from the positive supply line. In ‘dot’ mode, current consumption will be much lower than in ‘bar’ mode when up to 100 mA may be drawn from the battery when all LEDs (bar segments) are on. The FSM is powered by a 9V (6F22) battery.

The inductor in the filter is home made, it consists of 2.5 turns of 22 SWG copper enamelled wire. No core is used, and the internal diameter is 7 mm. The two-transistor combination behind the filter forms a high-gain amplifier whose output voltage is developed across one of three resistors connected to ground by the L-M-H sensitivity selector, S1.

The circuit should be installed in a metal box. The three LEDs for the lowest levels are green. Then come three yellow LEDs, two orange LEDs and finally two red LEDs for the highest fieldstrength levels. The highest level LED is wired to IC1 pin 10, the lowest level LED, to pin 1.

The FSM is a breeze to adjust. Connect a rubber helical antenna to the FSM input and key your transmitter on 145 MHz, running no more than 500 mW output. Set up the FSM at a reasonable distance from the transmitting antenna. Increase or decrease the distance to the antenna until two or three segments light, then adjust C1 for the highest number of segments to light. If necessary, adjust the brightness control P1 to suit ambient light conditions.

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